

# CONTAMINANT EXPOSURE AND EFFECTS TERRESTRIAL VERTEBRATES DATABASE FOR THE UNITED STATES

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## ABSTRACT

Over the past 5 years a "Contaminant Exposure and Effects--Terrestrial Vertebrates" database (CEE-TV) focused on coastal and estuarine habitat in the United States has been compiled through computerized search of published literature, review of existing databases, and solicitation of unpublished reports from conservation agencies, private groups, and universities. The database, a product of the Biomonitoring of Environmental Status and Trends program, is designed to help evaluate the threat of contaminants and other anthropogenic activities to terrestrial vertebrates residing in or near Atlantic, Pacific and Gulf coast estuaries, and the Great Lakes. Summary information has been entered into the database, including species, collection date, site coordinates, estuary name, hydrologic unit catalogue code, sample matrix, contaminant concentrations, biomarker and bioindicator responses, and reference source, utilizing a 108-field character and numeric format. The CEE-TV database is web accessible ([www.pwrc.usgs.gov/ceetv](http://www.pwrc.usgs.gov/ceetv)) in an easy to use searchable format, and receives about 3000 visits each year. Currently, the CEE-TV database contains 9836 records with ecotoxicological exposure and effects information on 400 species of amphibians, reptiles, birds, and mammals. Besides providing useful and interesting ecotoxicological information, the database has a number of potential applications, including focusing biomonitoring efforts to generate critically needed ecotoxicological data in the numerous "gaps" along the coast, reducing uncertainty about contaminant risk, identifying areas for mitigation, restoration or special management, and ranking the ecological conditions of estuaries.

## INTRODUCTION

The Biomonitoring of Environmental Status and Trends (BEST) program is designed to assess and monitor the effects of environmental contaminants on biological resources, particularly those under the stewardship of the Department of the Interior. BEST examines contaminant issues at the national, regional, and local scales, and uses field monitoring techniques and information assessment tools tailored to each scale. As part of this program, the threat of contaminants and other anthropogenic stressors to terrestrial vertebrates residing in or near to Atlantic coast estuarine ecosystems is being evaluated by a retrospective analysis of environmental contaminant exposure and effects data in amphibians, reptiles, birds and mammals.

## OBJECTIVES

1. Summarize information on contaminant exposure and effects in terrestrial vertebrates residing in or near Atlantic coast estuarine ecosystems.
2. Conduct a preliminary risk assessment of contaminant threats to terrestrial vertebrates at selected Atlantic coast estuaries to rank ecosystem health and identify critical data gaps.
3. Provide an interactive "user-friendly" web-based tool to aid managers and researchers in contaminant-related wildlife studies and management activities.

## METHODS

### Data Compilation

- Data were obtained through computerized literature searches, solicitation of unpublished agency reports, and search of existing institutional databases.
- Information including site and year of study, species studied, biological matrix analyzed, contaminant concentrations, biomarker response, and data source were entered into a 108-field database.
- Database and documentation were made accessible on the world wide web for interactive queries.

### Search Form

Search [CEE-TV] Database: Atlantic, Gulf, Pacific and Alaskan Coasts-Contaminant Exposure and Effects--Terrestrial Vertebrates (CEE-TV) Database: All - Microsoft Internet Explorer

Address: <http://www.pwrc.usgs.gov/ceetv/ceetvsearch20.cfm>

**USGS**  
Patuxent Wildlife Research Center

**CEE-TV Search Form:**  
Atlantic, Gulf, Pacific and Alaskan Coasts

Version 3.2, September 2001

[Skip to Search Form](#)

- Enter search text for any single field or combination of fields.
- Boxes with arrows are pull-down menus from which search text can be selected.
- Fields remaining blank in output indicate that no data were reported for that parameter.
- Combinations of terms can be used to focus the query.

[Complete documentation for this database](#)

**SEARCH FORM:**  
**Taxonomic Information:**

Example: To search for "black duck", enter it in the Common Name field. Alternatively, enter the word "duck" and all database records containing that term, including black ducks, will appear in the output.

Common Name:  [Table of Choices](#)

Genus and Species:  [Table of Choices](#)

Family:  [Table of Choices](#) Order:  [Table of Choices](#) Class:  [Select from Pulldown](#)

**Date of Study:**

Operator for Year of Study:  Year of Study (4 digit year):

**Geographic Information:**

State:  [Table of Choices](#)

Specific Name of Study or Collection Site (e.g., town, island, refuge):

Name of Estuarine Drainage Area (See [table of estuary names](#)):

USGS Hydrologic Unit (HUC) Code:

**Contaminant Information:**

Sample matrix that was analyzed:  [Table of Choices](#)

The following section permits selection of a contaminant, and allows you to specify an operator and value for searches.

Example: To search for all records that contain p,p'-DDE values greater than 20 ug/g, select the following from the pull down menus:

Contaminant: p,p'-DDE Operator: > Value: 20

Organochlorine Pesticides and Total PCBs:  Operator:  Value in ug/g:

Dioxin-Like PCB Congeners:  Operator:  Value in ng/g:

Dioxins and Dibenzofurans (Table of Abbreviations):  Operator:  Value in pg/g:

Dioxin-Like Toxic Equivalents (TEQs):  Operator:  Value in pg/g:

Metals, Metalloids, and Trace Elements:  Operator:  Value in ug/g:

Other Contaminants:

Organophosphorus Insecticide:  Clear Selection  Detected  Not Detected

Carbamate Insecticide:  Clear Selection  Detected  Not Detected

Petroleum Hydrocarbons:  Clear Selection  Detected  Not Detected

Biomarker/Bioindicator Responses:

Author or Information Source:

Other Contaminants and Miscellaneous Information (See Table):

Record No.:  (This field can be used to retrieve records cross-referenced in the "Other" field.)

[USGS Database Disclaimer](#)

Comments and additional references are greatly appreciated (E-Mail: [Barnett\\_Rattner@usgs.gov](mailto:Barnett_Rattner@usgs.gov))

## RESULTS

### Search Output

Search Results: Contaminant Exposure and Effects--Terrestrial Vertebrates (CEE-TV) Database: All - Microsoft Internet Explorer

Address: <http://www.pwrc.usgs.gov/ceetv/ceetvsearch20.cfm>

**Following Record is for Bald Eagle:**

Common Name:	Bald Eagle	Record No.:	10005	Genus/Species:	<i>Haliaeetus leucocapillus</i>
Family:	Accipitridae	Order:	Falconiformes	Class:	Aves
Year From:	1969	Year To:	1969	Location:	Dyer Neck
State:	ME	Estuary:	Coastal Drainage Area	HUC:	1050002
Latitude:	N44°26'35"	Longitude:	W67°56'50"	Matrix:	egg content
Sample Size:	1				
p,p'-DDE	20.55				
p,p'-DDD	0.84				
p,p'-DDT	0.49				
DIELDRIN	0.29				
HEPTACHLOR EPOXIDE	0.03				
Total PCBs	15.2				
OC Units	ug/g				
MERCURY	0.3				
METAL Units	ug/g				
BIOMARKER	Eggshell Thickness				
BIOMARKER Value	11% decrease				
Other	Biomarker data from Franklin, Dyer Neck, and Boyden Pond				
REFERENCE	Wiemeeyer et al., 1972				

Codes: -2 = not detected

### Summary Information

Total number of records: 9836

Individuals per record: 1 to 37,590

Total number of individual animals: ~250,000

Total number of species represented: 400

17.3%	Mammals
78.0%	Birds
4.3%	Reptiles
<0.5%	Amphibians

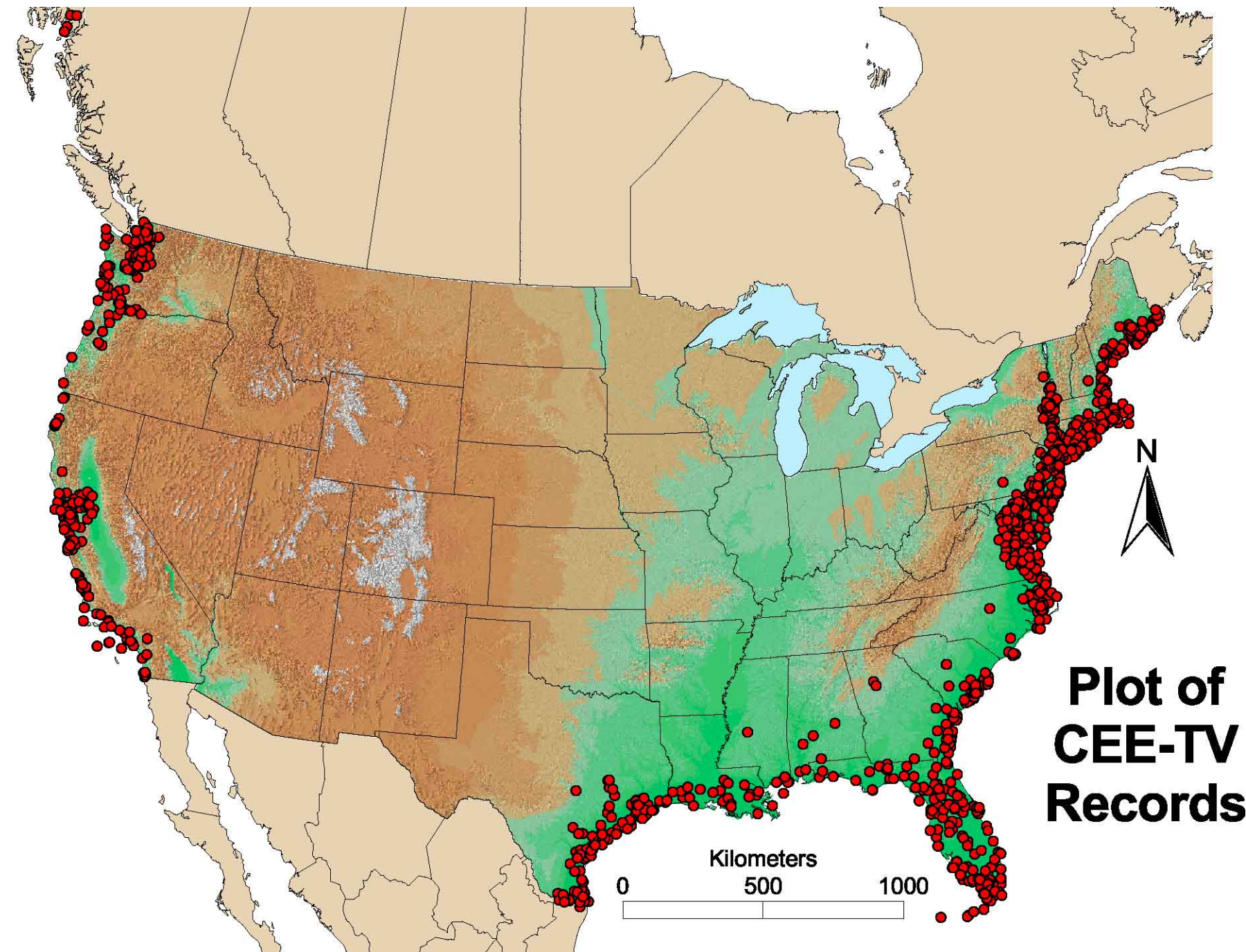
Sample matrices studied: 47

Unique contaminants: only 200

### Contaminant Information

Contaminant	Contained In:
DDE, DDD and DDT	45% of records
Ah-receptor active PCB Congeners + Dioxins + Dibenzofurans	2% of records
Hg	21% of records
Pb	19% of records
Biomarker/bioindicator responses	11% of records

### Geographic Distribution of Records



### Total Number of Records per State

#### Atlantic Coast

Maine: 249  
New Hampshire: 30  
Massachusetts: 176  
Rhode Island: 40  
Connecticut: 99  
New York: 900  
New Jersey: 411  
Pennsylvania: 54  
Delaware: 182  
Maryland: 471  
Virginia: 385  
North Carolina: 209  
South Carolina: 406  
Georgia: 251  
Florida: 1178

#### Gulf Coast

Texas: 1035  
Alabama: 43  
Mississippi: 55  
Louisiana: 242

#### Pacific Coast

California: 1840  
Oregon: 289  
Washington: 703  
Alaska: 657

## PRODUCTS and FUTURE ACTIVITIES

- Information in the CEETV database has been summarized and evaluated to contaminant threats to terrestrial vertebrates, to rank ecosystem health in Atlantic Coast estuaries, to identify data gaps, and to focus biomonitoring efforts to generate critically needed information on contamination and other anthropogenic threats to estuarine wildlife.
- A detailed analysis of critical data gaps was performed for National Parks and National Wildlife Refuges on the Atlantic Coast.
- Expansion of the CEETV database will include Hawaii (estimated completion in 2002) and the Great Lakes (estimated completion in 2003).

